

45.3 AAHU's for mink. For the shallow-draft lock plans, 26.2 AAHU's for great egret and 39.1 AAHU's for mink would be provided. The mitigation plan would fully compensate for impacts of the graving site. Excess habitat created through the beneficial use of dredged material has no definitive cost attached to it since any difference in cost between wetland restoration and the least costly, environmentally acceptable plan (disposal into the confined MRGO disposal area) has not been determined.

5.3.19. Aquatic Habitats

5.3.19.1. Affected Environment

5.3.19.1.1. General. Major water bodies in the study area include the MRGO, the IHNC, the GIWW, and the Mississippi River. In addition, there are lagoons, ponds, bayous, canals, and open water-subsidized marsh areas within the study area. The major waterways provide migratory paths for many estuarine and freshwater species of fish, shellfish and other aquatic organisms. The smaller water bodies provide shallow, protected nursery habitat for many of the same species. A large proportion of these aquatic species are commercially and recreationally important. In addition to freshwater aquatic habitat, the Mississippi River provides the municipal water supply for Orleans, Jefferson, St. Bernard, and Plaquemines Parishes. A number of industries use water from the Mississippi River for various industrial purposes, and river and the IHNC receive significant amounts of pollutants from these industrial sources. The IHNC and the brackish waters of the study area receive stormwater runoff pumped from the developed sections of the study area.

5.3.19.1.2. Fisheries Resources. The major freshwater habitat of the study area is the Mississippi River. A limited recreational and commercial fishery occurs in the river and its associated batture areas and borrow pits. The primary species targeted are channel catfish, blue catfish, and flathead catfish. Other species harvested include largemouth bass, alligator gar, spotted gar, black crappie, white crappie, white bass, yellow bass, striped bass, and various species of sunfish. In some years during low river stages, saltwater species of fish ascend the river well above New Orleans. At these times, red drum, striped mullet, southern flounder, and other species are caught.

The MRGO, the GIWW, and the IHNC, between Lake Pontchartrain and the intersection with the GIWW, are artificial channels which directly connect Lake Pontchartrain with the Gulf of Mexico. Migratory estuarine species utilize these waterways for seasonal movements. Important species found in these waterways include spotted seatrout, sand seatrout, Atlantic croaker, red drum, black drum, southern flounder, striped mullet, blue crab, and white and brown shrimp. Since the main purpose of the IHNC, GIWW, and MRGO is navigation, a large number of industries, including a large bulk terminal, container terminal, and marine repair and service facilities, are located on the banks of these waterways. Due to the large amount

of commercial traffic in the IHNC, the Port of New Orleans prohibits all types of fishing activities in the waterway. This is mainly for safety reasons, since the tidal current in the IHNC between Lake Pontchartrain and the GIWW can cause problems for vessels navigating this channel. Recreational and commercial fishing activities in the GIWW and MRGO are common.

5.3.19.1.3. Water Quality. An analysis of water quality data was conducted to determine existing water resource conditions and to develop a background for water quality projections. In-situ water quality has been determined using available data from various stations which are sampled at periodic intervals. Stations have been established by the U.S. Army Corps of Engineers, the U. S. Geological Survey, the Louisiana Department of Health and Hospitals, and the Louisiana Department of Natural Resources. Data from these stations have been compared with appropriate State and Federal criteria for aquatic life and human health to evaluate existing water quality and determine whether criteria are met.

Specific samples were also collected for this study. Water samples were collected from the Mississippi River, the IHNC, and the area designated for mitigation. Bottom sediment samples were collected from the IHNC and the mitigation site. The sediment samples were mixed with ambient water to produce elutriate samples which simulate the short-term, worst-case effect of dredging and disposal.

Potential water quality problems in the Mississippi River in the vicinity of New Orleans include heavy metals, pesticides, and pathogens. Trace metal concentrations occasionally violate criteria levels. However, with the exception of minor increases in concentrations of lead, zinc, and iron, trace metal concentrations have shown a decreasing trend with time because of improved industrial waste water treatment. Most pesticides and other synthetic organic compounds are only detectable, if at all, at very low concentrations. Pesticide levels have been decreasing with time because of prohibitions on the most toxic and persistent compounds, and improved treatment of industrial waste water has reduced the average concentrations of most other organic compounds. This segment of the Mississippi River is currently classified by LDEQ as fully supporting its designated uses of secondary contact recreation, fish and wildlife propagation, and drinking water supply, but not supporting primary contact recreation. The level of fecal coliform bacteria is the primary parameter for determining primary contact recreation support. Data from the Mississippi River downstream of New Orleans indicates that fecal coliform levels are violated approximately 16 percent of the time. According the LDEQ criteria, this segment of the river partially supports its use for primary contact recreation.

The water quality of the IHNC is influenced by discharges directly into the canal and inputs from connecting streams, especially the Mississippi River. Direct discharges include stormwater runoff, industrial point sources, and vessel discharges. There are no municipal waste discharges into the IHNC, although small quantities of local

domestic wastes may be discharged. Historic water quality data indicate the presence of magnesium, manganese, iron, lead, zinc, chromium, cadmium, copper, mercury, and nickel. EPA saltwater aquatic life criteria levels have been exceeded for copper and lead, and possibly for mercury. Thus, historically, there is an indication that the IHNC is subject to periodic metals contamination. Analysis of the water sample collected from the IHNC during the 1993 sampling effort showed results similar to historic data. Fecal coliform bacteria levels in the IHNC are high, probably from influxes from the Mississippi River, domestic wastes from developments along the IHNC, and accumulated benthic deposits conducive to coliform re-growth. The LDEQ has classified the IHNC as water quality limited.

No sampling stations are located in the proposed mitigation site. The water sample collected in 1993 for this study showed the presence of many of the same metals found in the IHNC. Since there was only a single sample analyzed, a generalization cannot be made about the existing water quality in the area. However, the water quality appears to be similar to the quality of water in the IHNC, although fluctuations do exist. The quality of this aquatic habitat is negatively affected by urban stormwater runoff from a large pumping station and possibly by leachate from a closed landfill located in the vicinity. As a result, the mitigation site provides low quality habitat for estuarine fish and shellfish species.

In general, the dissolved oxygen content (DO) of the water in the study area is high and the biological oxygen demand (BOD) is low. One problem area is the IHNC between the GIWW and the lock, where most of the water movement comes through the IHNC lock from the Mississippi River. Pollutants contained in the Mississippi River water, combined with industrial, stormwater, and non-point source discharges and the low flushing action in this part of the IHNC, result in DO values as low as 0.1 milligrams/liter (mg/l) and BOD values as high as 10.6 mg/l. These problems decrease as the GIWW flows eastward.

Average tidal flow in the IHNC between the GIWW and Lake Pontchartrain is approximately 14,000 cfs. There is evidence of saltwater stratification in Lake Pontchartrain near the IHNC and in the IHNC. The direct connection of the IHNC with the gulf via the GIWW and MRGO allows saline, and hence more dense gulf water, to work its way along the bottom of the pass toward Lake Pontchartrain.

5.3.19.2. Plan 1 (No-Action). Occasional DO and fecal coliform bacteria violations would likely occur in the Mississippi River during periods of low flow. Such violations would be reduced by continued improvements in sewage treatment practices. Pesticide exceedances of EPA criteria should be greatly reduced due to prohibitions of the most toxic and persistent compounds. Occasional violations of criteria in the Mississippi River for chromium, copper, mercury, and lead would likely continue, as would violations for copper, mercury, and lead in the IHNC. Continued implementation and enforcement of EPA effluent limitation requirements should result

in a gradual reduction of heavy metals and the number of carcinogens, but it is unlikely that they would be completely eliminated. Use of the study area by aquatic species is expected to continue similar to existing conditions.

5.3.19.3. Plan 2. Bridge replacement at St. Claude Avenue would disturb bottom sediments in a small area of the IHNC. A relatively small amount of dredging in the IHNC to increase the width of the channel where the existing bridge is located would likely be necessary. Impacts on water quality would be localized, minor, and of short duration. Some turbidity increases during construction would occur. Whatever material is excavated would be hauled or barged away and deposited in an upland site. No significant effects on the water quality of the area would be anticipated.

5.3.19.4. Plans 3a, 3b, 3d, and 3e. These plans are all for shallow draft locks. The quantity of material to be excavated for each is similar and hence, potential impacts on aquatic resources are similar. The quantity of material to be excavated during various construction phases for the different lock sizes are shown in Table 9.

Impacts to the aquatic environment would result from dredging and filling activities and other construction activities. Data from detailed studies, especially the 1993 elutriate testing, have been used to project impacts to the aquatic habitat that would reasonably be expected from project implementation. The elutriate test is a simplified simulation of the dredging and disposal process wherein predetermined amounts of dredging site water and sediment are mixed together to approximate a dredging slurry. The test provides an indication of the chemical constituents likely to be released into the water column during a dredging or filling operation.

Five disposal sites would be utilized for project construction as shown on Plate 26. The sites are referred to as the river site (hydraulically pumped into the main channel of the Mississippi River); the mitigation site (hydraulically dredged and used to restore wetlands); the MRGO site (hydraulically dredged and disposed in a previously-used, confined site); the IHNC site (material excavated by bucket dredge and used for backfill); and the grading site (bucket dredged and used for levee construction and grading).

Impacts to the water quality at the mitigation site, MRGO site, and the IHNC site are expected to be related mainly to increased concentrations of ammonia, copper, manganese, and zinc, and suspended sediments. Elutriate data from a mixture of IHNC water and sediment taken from the bottom in 1982 indicate that problem constituents would be ammonia, copper, and manganese. Elutriate data from 1993 indicate that copper, manganese, and zinc are potential problem constituents. Ammonia was not analyzed in the 1993 effort. The 1982 elutriate copper concentrations were about six times the level of the ambient water and the 1993 elutriates were two to fourteen times the levels found in ambient water. These elutriate levels, although higher than the acute criteria level, are generally within the range of concentrations

TABLE 9
ESTIMATED DREDGING QUANTITIES IN CUBIC YARDS FOR PLANS 3a THROUGH 3f

Area to be Dredged	Plans 3a and 3b (900x90x22) (900x110x22)	Plan 3c (900x110x36)	Plans 3d and 3e (1,200x90x22) (1,200x110x22)	Plan 3f (1,200x110x36)
Utility Corridors				
St. Claude Avenue (Stockpiled for Backfill)	45,000	75,000	45,000	75,000
Claiborne Avenue (Stockpiled for Backfill)	60,000	37,000	60,000	87,000
Florida Avenue (Stockpiled for Backfill)	20,000	38,000	20,000	38,000
North Bypass Channel				
(Top 5 feet of Soil - Pumped to MRGO Site)	190,000	206,000	190,000	206,000
(Below 5 feet - Pumped to Mitigation Site)	500,000	667,000	500,000	667,000
New Lock Excavation				
(Pumped to MRGO Site)	210,000	883,000	310,000	1,100,000
Main Channel North of New Lock				
(Pumped to MRGO Site)	0	56,000	0	58,000
South Bypass Channel (Random Backfill)				
	145,000	145,000	145,000	145,000
Main Channel Between Old Lock and New Lock				
(Random Backfill)	213,000	338,000	213,000	440,000
(Pumped into River)	0	110,000	0	0
Main Channel from Old Lock to the River				
(Random Backfill)	150,000	0	150,000	55,000
(Pumped into River)	0	227,000	0	172,000
Total Dredged	<u>1,533,000</u>	<u>2,832,000</u>	<u>1,633,000</u>	<u>3,043,000</u>

found in the Mississippi River, the IHNC, and surrounding areas. Historic monitoring shows that copper levels in the waters of the project area frequently exceed applicable acute criteria under ambient conditions.

Elutriate samples from 1982 and 1993 showed high levels of manganese in the upper sediment samples. The relatively small amount of material containing high levels of manganese would be dredged in short time frame, and its effluent would be diluted from the continued placement of dredged material. Zinc is abundant in surface waters and is known to accumulate in animal tissue. Elutriate testing shows that the zinc concentrations for some samples exceed the acute criteria level.

The most obvious effect during, and for some time after disposal, would be significantly increased levels of turbidity from clay and silt particles. The water in this area is normally quite turbid from high concentrations of phytoplankton, zooplankton, and organic detritus, and high winds increase turbidity levels considerably above normal levels by suspending bottom sediments containing a high percentage of organic material and fine mineral sediments. The ability to see more than 1.5 feet into the water in this area is very unusual, with visibility limits of 0.5-1.0 feet being the average. The high ambient turbidity of this site reduces the net effect of dredging-induced turbidity levels.

The marsh vegetation which would establish in the mitigation site would provide desirable marsh-edge habitat for estuarine fish and shellfish. The long-term effect of dredged material disposal at the mitigation site is expected to be an improvement in the quality of the aquatic habitat. Up to 3 years may be required for dredged material to become completely vegetated and for the area to reach its optimal level of quality for aquatic species.

These plans would not require disposal of dredged material in the Mississippi River. The deep draft lock alternatives, discussed next, would require disposal in the river.

5.3.19.5. Plans 3c and 3f. The impacts of these plans would be similar, but more pronounced than those impacts discussed for Plans 3a, 3b, 3d, and 3e. The total amount of material which must be excavated and disposed for these plans is 2,832,000 cubic yards for Plan 3c and 3,043,000 for Plan 3f. For the previously discussed plans, the total quantity of material to be excavated ranges between 1,533,000 cubic yards and 1,633,000 cubic yards. This increased amount of material would require a longer period of dredging. The short-term, adverse impacts of disposal described for the shallow-draft plans would be extended for a longer period of time. For these deep-draft alternatives, dredging would be required in the channel of the IHNC, north of the new lock site, whereas no dredging in this area is necessary for the shallow-draft lock alternatives. Also, some of the material dredged between the old lock site and the Mississippi River would be disposed in the river.

Water quality impacts from material disposed there are expected to be minimal, mostly related to the potential temporary increased concentrations of ammonia, chromium, copper, and zinc. The degree of increase in the concentration of ammonia would depend on the water temperature at the time of disposal with cooler temperatures reducing the potential for elevating the concentration.

During the period of dredged material disposal into the Mississippi River, suspended sediment concentrations would increase and DO would tend to decrease in the immediate area of disposal. Disposal of material into the river would increase the river's sediment load by as much as 27,000 tons per day which represents about 4 percent of the river's average sediment load in the vicinity of New Orleans. A total of about 172,000 cubic yards of material would be disposed in the river for Plan 3f (TSP). Plan 3c would require disposal of 227,00 cubic yards into the river. All of this material would be dredged near the end of the construction period and is expected to take several weeks. No measurable adverse effects to the aquatic life in the Mississippi River or drinking water supply intakes downstream would be expected.

5.3.20. Aesthetic Values

5.3.20.1. Affected Environment. A significant aesthetic resource of the study area is the Holy Cross levee and batture area - a passive recreational area used for fishing, picnicking, jogging, and walking. This area provides a visual amenity for residents of the Holy Cross neighborhood, who view the river, watch barges and ships passing, and catch a glimpse of downtown New Orleans. It is estimated that 20 percent of the Holy Cross residents and 5 percent of the Lower Ninth Ward residents, or about 2,000 people, use the levee and batture. Another significant aesthetic resource in the IHNC area is the stand of 18 live oaks located north of the St. Claude bridge on the east bank of the IHNC. This site is owned and maintained by the U.S. Army Corps of Engineers. Although the area is fenced and not available to the public, it provides a visual amenity for residents of the Lower Ninth Ward who live near Jourdan Avenue and for other residents passing over the St. Claude Avenue bridge.

The Bywater and Holy Cross Districts are two neighborhoods in the IHNC study area listed on the National Register of Historic Places. Within these historic districts, the majority of the buildings have historic and architectural significance which is high in aesthetic value. The Bywater Historic District is a mixed residential-commercial area spanning 120 city blocks. The Holy Cross Historic District is primarily residential, covering a 60-block area. Building types in both historic districts include Creole cottages, shotgun houses, camelback houses, side hall plan houses, and bungalows. Both districts are aesthetically unique due to the diverse style and complementary architectural features present. Most of the residential structures are painted in light pastel colors. Trees are present along the streets in both neighborhoods. They provide shade and a visual softness to the street environment.

There is a community garden located on the east side of the IHNC, just north of St. Claude Avenue. The garden is on the same square block as an octagonal building housing a sewage pumping station. This community garden is maintained by local residents and serves as a cohesive element in a small area of the Lower Ninth Ward neighborhood.

5.3.20.2. Plan 1 (No Action). Aesthetics of the study area would remain unchanged. Passive use of the batture/levee area for walking and viewing the river would continue at its present use. Batture vegetation, consisting mainly of willow trees, would continue to grow, blocking some views. Selective pruning of the trees would likely occur to maintain the current viewing level. The stand of 18 live oak trees, located north of the St. Claude bridge on the east bank of the IHNC, would continue to grow, thereby maintaining and enhancing the aesthetic values of this resource. Neighborhood architectural aesthetics would continue to reinforce the historic district's unique character and charm.

5.3.20.3. Plan 2.

5.3.20.3.1. Effects.

Construction of the new bridge would impose short and long-term visual impacts within the corridor of development. Short-term negative impacts would occur from the operation of heavy construction equipment. Over the long-term, occupants of adjacent residences would experience a larger and higher bridge than the St. Claude Avenue bridge which they have become accustomed to. This new bridge would dominate adjacent homes by its height and proximity. However, the access ramps for the new bridge offer potential positive attributes. Through the replacement of two 10-foot-high parallel walls existing beneath the old bridge, views would become open under the bridge toward homes on both sides. Improved pedestrian accessibility and air circulation beneath the bridge would likely be viewed positively by nearby residents. The new vertical supporting columns would be enhanced by the application of a textured surface, brick facade treatment, or painting. The area beneath the bridge ramps would be lighted and landscaping would be included where appropriate.

5.3.20.3.2. Mitigation.

Mitigation for loss of aesthetic values would be less extensive than that planned for lock replacement alternatives. The following mitigation features are proposed.

- a. Exterior surfaces of bridge approaches and bridge piers would be textured for appearance and to discourage graffiti.
- b. Areas surrounding bridge approaches would be landscaped.
- c. Lighting along existing roads to be used for detour routes would be improved. Lighting along new detour roads would be provided.

d. Existing detour roads would be landscaped.

e. Lighting and open space would be provided in vacant areas created by reconstruction of the St. Claude Avenue bridge approaches.

f. A program of street resurfacing and lighting and drainage improvements would be implemented within a four-block area on each side of the IHNC.

5.3.20.4. Plans 3a through 3f

5.3.20.4.1. Effects.

These plans would reduce access to sections of the levee and batture adjacent to the IHNC due to realignment of levees and replacement of levees with combination levee/fold-down floodwalls. Floodwalls when raised, would extend about 4 feet above the new levees, presenting a physical and visual barrier to persons walking across the levee. This barrier will exist only in times of high water and would be temporary. There would be a reduction in the aesthetic appeal of the levee and batture during levee and fold-down floodwall construction. This unique fold-down floodwall will provide a hard-surfaced, raised walking platform for residents to stroll along the IHNC and river during normal river levels. Benches and landscaping will be included along this area providing shade and creating a promenade for residents and visitors to use. Walks would be developed connecting the fold-down floodwall promenade to adjacent pedestrian sidewalks, and streets.

The stand of 18 live oak trees situated between Sister Street and the IHNC lock would be lost with implementation of the project. These trees are approximately 75 years old and their life expectancy is at least another 25 years or more. The community garden located in this same area would not be affected.

Adverse impacts would occur to the visual environment in the vicinity of the St. Claude Avenue bridge. This bridge would be replaced with another low-level bridge, but the height of the new bridge would be approximately 18 feet higher in the center than the existing structure. The slope of the approaches to the new bridge would be slightly steeper than the existing approach ramps and the new ramps would reach ground level at the same points as the existing ramps. The lower sections of the existing approach ramps would likely remain in place. Residents whose houses face the higher portions of the approach ramps would be most directly impacted by this visual intrusion into their neighborhood.

The Holy Cross Historic District is already visually impacted by the St. Claude Avenue bridge approach. Still, there would be an additional visual impact to the Holy Cross neighborhood due to the heightening of the east side bridge approach. Aesthetic improvements would result with the removal of a large portion of the "concrete wall" under the bridge approaches facing homes. This wall supporting the upper roadway

would be eliminated and open space created beneath these ramps on both the east and west side of the new St. Claude Avenue bridge. The new bridge approaches would allow passage beneath its deck providing unrestricted access between neighborhoods on either side of St. Claude Avenue. Lighting would be provided to improve safety under the new bridge ramps and help deter vandalism and dumping of trash.

Several features which are appropriate for construction projects in an urban environment are included in the project construction plan. These features are designed to avoid and minimize adverse effects on the adjacent community. They are as follows:

- a.* Exterior surfaces of lock walls, floodwalls, bridge approaches, and bridge piers would be finished with textured surfaces and shadow patterns to add visual appeal and discourage graffiti.
- b.* Areas surrounding levees, floodwalls, and bridge approaches would be landscaped.
- c.* Lighting along existing roads to be used for detour routes would be improved. Lighting along new detour roads would be provided.
- d.* Green space at the new lock site would be created by back-filling the area created by tying the lock walls to the Claiborne and Florida Avenue Bridges on the east side and the Claiborne Avenue Bridge on the west side. The area would be made available for local agencies to develop into ball fields, walking paths, playgrounds, etc.

5.3.20.4.2. Proposed Mitigation

- a.* Compensation for the loss of the stand of live oak trees near the existing lock would involve either transplanting some of the trees to nearby public lands, or if this is not feasible, planting of nursery stock.
- b.* A walking, jogging, and biking path would be built as part of the fold-down floodwall, replacing potentially lost recreational opportunities associated with the placement of a floodwall on the levee. The path would be extended to the Chalmette Unit of the Jean Lafitte National Park in St. Bernard Parish.
- c.* One or more observation decks, with interpretive displays and benches, would be constructed near the new floodwall to preserve the current recreational viewing opportunities.
- d.* Lighting and green space would be provided in vacant areas created by reconstruction of the St. Claude Avenue bridge approaches.
- e.* Areas within the public right-of-way along existing streets would be landscaped to add green spaces and visual buffers between the road and houses.

5.3.21. Recreational Opportunities

5.3.21.1. Affected Environment. Ten parks/playgrounds, two recreation centers, and several pools operated by the New Orleans Recreation Department are located in the IHNC area. In addition to the parks/playgrounds, recreation centers, and pools, there are limited open spaces that provide areas for local residents to enjoy passive recreation. These open areas include the levee and batture south of St. Claude Avenue in the Holy Cross neighborhood. On the levee within the Holy Cross neighborhood, a jogging and walking path is well used. Residents fish along the banks of the river and picnic in the grassy field on the protected side of the levee. In conjunction with enlargement of the Mississippi River levee immediately downstream of the lock, a series of eight benches have been recently installed on the levee crown. These benches provide a promenade area with passive rest spots for residents and visitors to sit and view river activity.

Although most of the recreational facilities primarily serve the adjacent neighborhoods, the Oliver Stallings Center and the Stallings Pool serve a large area and attract residents from the Lower Ninth Ward and Holy Cross neighborhoods. These facilities are more regional in their appeal, requiring some residents to cross the IHNC in order to use them. Activities at the Stallings Center include volleyball, basketball, exercise programs, weight lifting, swimming, and bingo. These activities are planned for all age groups, including senior citizens. The director of the Stallings Center reports that the facilities are extensively used by area residents on both sides of the canal. Neighborhood schools use the gym for intramural games.

5.3.21.2. Plan 1 (No Action). Recreational use of the study area would remain relatively unchanged. Residents and those working at the U.S. Coast Guard Station would continue using the levee crown for walking, jogging, and bicycling. The parks, playgrounds, recreation centers, and public pools would likely continue to operate without significant change. Field sports and batture activities, such as fishing, would continue to exist, similar to current conditions.

5.3.21.3. Plan 2. Pedestrian activity would change around the new St. Claude mid-level bridge and its approach ramps. During construction of the new bridge, pedestrian and bicycle traffic across the canal would be eliminated. After the new bridge is operational, residents on the up-river side of the canal who walk or bicycle across the St. Claude bridge to access the levee in the Holy Cross neighborhood would be required to use stairways or a long ramp to reach the bridge deck where a protected walkway would be provided to cross the canal.

The mitigation plan for this alternative would include construction of playgrounds, gardens, tot lots, and linear parks in the four nearby neighborhoods. These facilities would be operated by non-Federal interests.

5.3.21.4. Plan 3a through 3f. Residents of nearby neighborhoods who must cross the IHNC at St. Claude Avenue to reach community recreation facilities would find them less accessible during the construction period due to temporary bridge closures and construction traffic. Pedestrian access will continue across the temporary St. Claude Ave. bridge while the permanent bridge is being constructed. Increased traffic during temporary closure of the Claiborne Avenue bridge would also negatively affect accessibility to the recreational facilities. Recreational use of the levee in the form of walking, jogging, bicycle riding, and other activities would be temporarily impacted during construction. A fold down floodwall will be installed with implementation of this plan. This floodwall when raised, would extend about 5 feet above the new levee, presenting a physical and visual barrier to persons walking across the levee. This unique fold-down floodwall when not raised will provide a hard surface raised walking platform for residents to stroll along the IHNC while viewing the working lock. Benches and landscaping will be included in this area providing positive aesthetic conditions, while creating a sitting/viewing promenade for residents and visitors to use. Walks would be developed connecting the fold-down floodwall/promenade to adjacent pedestrian sidewalks, and streets.

The walking/jogging/biking path and the green space to be created near the new lock, mentioned in Section 5.3.20.4.2., would mitigate for impacts to recreational opportunities as well as aesthetic values. Likewise, the community facilities to be constructed, mentioned in Section 5.3.8.4.2, would also mitigate for impacts to recreational opportunities.

5.3.22. Cultural Resources including National Register Listings

5.3.22.1. Affected Environment. The area around the IHNC is a diverse region containing several properties eligible for the National Register of Historic Places. These properties have been identified by a number of cultural resource investigations sponsored by the New Orleans District and coordinated with the State Historic Preservation Office (SHPO) and provided to the Advisory Council on Historic Preservation (ACHP).

Two districts listed in the National Register of Historic Places are located in the project area: the Holy Cross Historic District and the Bywater Historic District. Their locations are displayed on Plate 27. The Holy Cross Historic District is significant for its classic New Orleans architectural patterns. The majority of the homes are single and double shotguns which possess either Italianate or Eastlake details. The Bywater Historic District is architecturally significant for the quality of its mixed collection of residential and commercial buildings dating from the period 1907 to 1935. In addition to commercial buildings, four major building types are found in the area: shotguns, camelbacks, bungalows, and pyramidal cottages.

The IHNC Lock, constructed between 1918 and 1921, was the subject of a comprehensive study by the New Orleans District completed in 1987. The study determined that the lock is eligible for inclusion in the National Register of Historic Places. The St. Claude bridge, a Strauss Heel Trunnion Bascule bridge built between 1918 and 1921, has also been determined eligible for the National Register of Historic Places as a result of a 1991 study by the New Orleans District.

The Galvez Street wharf, designed by the office of the Board of Commissioners of the Port of New Orleans in 1922 and erected by 1929, was among the first improvements to the IHNC area after the canal was constructed. This rectangular, multi-bay industrial structure is supported by a metal frame with a roof of corrugated zinc. The building is significant for its historical associations with the early period of development along the IHNC. The building was determined eligible for the National Register of Historic Places after a comprehensive architectural assessment and preliminary archeological review of the area west of the IHNC was completed. That assessment and review was conducted from November 1991 to January 1992 and was followed by consultation with the SHPO.

An evaluation of Sewerage Pumping Station "B" to determine if the structure is eligible for inclusion in the National Register of Historic Places was also conducted under contract to the New Orleans District. This study was based on archival research, including architectural and engineering aspects of the structure, and on-site evaluations of Station B. Upon completion of the study, the contractor recommended that it be considered eligible for inclusion in the National Register of Historic Places. These recommendations were coordinated with the SHPO.

Review of archaeological studies and intensive background research in the area revealed no prehistoric or historic archeological sites. The project area is located adjacent to the Mississippi River in a section of the Mississippi River delta plain which was deposited only a few thousand to a few hundred years ago. The extensive disturbance resulting from construction at the existing lock and other factors has destroyed any prehistoric sites that may have existed in the project area.

A cultural resources investigation of the proposed detour road between St. Bernard Highway and Florida Avenue was completed and coordinated with the State Historic Preservation Office. The detour route would traverse an area that consisted of unimproved land and a cypress swamp throughout much of its recent history. Geomorphological analysis indicates that no crevasse splays, former distributaries, or subsided natural levees that could have been occupied by Native Americans exist in the area of the proposed road. An examination of historic maps and a number of primary and secondary sources shows no evidence of habitation, agricultural production, or military activity in the project area in the eighteenth and nineteenth centuries. The Battle of New Orleans in 1815 was fought close to the area but there is no evidence of military activities in the immediate area of the proposed road. No improvements were

made in the area until the second half of the twentieth century. Any cultural resources in the path of the proposed detour road would date from the very recent past and would not be eligible for the National Register of Historic Places. Field investigations would be necessary to verify that no cultural resources exist in the detour route area. The results of this study would be coordinated with the SHPO.

A cultural resources investigation of the graving site has been completed. Background information has been gathered to develop a comprehensive understanding of the area. Research included a review of historic maps, aerial imagery, the State Archeologist's site files, the National Register of Historic Places, geological and geomorphological data, archeological reports, archives, and public records. Background research and field inspection indicates that no cultural resources exist in the project area. A report recommending no further cultural resources investigations would be coordinated with the SHPO.

5.3.22.2. Plan 1 (No Action). The study area has been impacted by a number of historic developments that have destroyed both prehistoric and historic cultural resources. This trend would continue. Minor changes to the IHNC lock would continue as required for operations and maintenance purposes. Eventually the IHNC lock would have to undergo a major rehabilitation. This would require coordination with the SHPO and ACHP and documentation to the standards of the Historic American Engineering Record.

At some time in the future, the St. Claude bridge would require extensive rehabilitation or replacement with a new bridge. This would also require coordination with the SHPO and ACHP and documentation to the standards of the Historic American Engineering Record.

Historic structures in the Holy Cross and Bywater Historic Districts would continue to deteriorate or to be modernized. While the Historic Districts Landmark Commission would prevent some modifications, continued changes would be inevitable. Over time, the historic districts would be adversely impacted by these changes, leading to a deterioration of the unique historic character of the area.

5.3.22.3. Plan 2. This alternative would require demolition of the St. Claude bridge, a property eligible for the National Register of Historic Places. After additional consultation with the SHPO and the ACHP, the bridge would be documented to Historic American Engineering Record standards.

Construction of a mid-level replacement for the St. Claude bridge could have a negative visual impact on the Holy Cross and Bywater Historic Districts. An assessment of the visual impacts of mid-level bridge construction was conducted under contract to the New Orleans District. The results of this study indicate that the potential for visual impacts to the Bywater Historic District is greatest within the eastern portion of the

district. From more central and western portions of the district, the bridge would not be visible or would be only a minor element of the visual landscape. St. Claude Avenue is one exception to this conclusion. The avenue crosses the district, and a relatively unobstructed view of the new structure would be possible at any point on the avenue west of the bridge

In order to reduce visual impacts of new bridge construction on the eastern portions of the Bywater District, foliage would be planted to shield the bridge from the neighborhood and the bridge would be designed in a manner to reduce visual impacts as much as possible.

The potential for visual impacts to the Holy Cross Historic District as also been investigated. From the central and eastern portions of the district, new bridge construction has little potential for visual impact to the historic setting. A mid-level bridge from these areas would generally be only a minor element in the visual background. In addition, foliage that is present within these areas would, from many vantage points, totally shield the viewer from all of the elements of the new bridge

From the western portion of the Holy Cross District, there is greater potential for visual impact. From some vantage points, most elements of the bridge may be visible. From other points, at least some of the taller elements may be visible. In order to reduce visual impacts of the new bridge on the Holy Cross Historic District, foliage would be used to shield the neighborhood from the view of the bridge and the bridge would be designed to reduce visual impacts as far as possible.

5.3.22.4. Plans 3a through 3f

5.3.22.4.1. Effects

This alternative would require demolition of the IHNC lock, the St. Claude Avenue bridge, and the Galvez Street wharf. All of these properties have been determined eligible for the National Register of Historic Places. The loss of these three structures would be mitigated by recordation to Historic American Engineering Record standards prior to demolition. In addition, the Galvez Street would be documented to Historic American Building Survey standards before demolition. Additional consultation with the SHPO and the ACHP would be necessary in order to reach agreement on the details of the mitigation plan for each of these structures.

There would be no significant impact to any historic or prehistoric archeological properties in the project area other than the three structures mentioned above. No structures in either the Bywater or Holy Cross Historic Districts would be moved or destroyed. The visual impacts described for Plan 2 are not applicable to these plans since this plan includes a low-level bridge at St. Claude Avenue.

5.3.22.4.2. Proposed Mitigation

- a.* One or more key, historically-significant components of the existing lock and/or the St. Claude Avenue Bridge would be salvaged.
- b.* A brochure addressing various historical features of the existing lock and St. Claude Avenue bridge as well as significant historical attributes of the surrounding community would be published. This brochure may be featured in a visitor information center at the new lock or other suitable locations.
- c.* Historical markers and displays which feature appropriate information concerning the existing lock, St. Claude Avenue bridge, and/or the surrounding neighborhoods would be erected. The markers would be patterned on those associated with National Register locations.
- d.* Oral histories would be collected from residents of the neighborhoods to preserve the history of the area around the IHNC. Interviews would be conducted with knowledgeable residents of the area, transcribed, and deposited in repositories in the neighborhood.
- e.* A large display concentrating on maritime history would be constructed in the area. This display would interpret the history of navigation in New Orleans and the south Louisiana area. It could incorporate some part of the mechanism of the existing IHNC Lock in the interpretive program.

5.4. SECONDARY/CUMULATIVE EFFECTS

5.4.1. All Plans including No-Action.

Changes in both vehicular and navigation traffic would occur in the IHNC vicinity from bridge improvements by others. The replacement bridge at Florida Avenue for trains and local vehicular traffic will remove a navigation hazard. The replacement bridge will also be more reliable than the existing bridge, significantly reducing detours and delays during closure periods for bridge repair. The adverse impacts from this replacement bridge would be minimal, as the U.S. Coast Guard has authorized it under a categorical exclusion to NEPA documentation.

The new high-rise or mid-rise bridge at Florida Avenue to be built by the State of Louisiana will also improve traffic flow across the IHNC. The alignment and construction details of this bridge are still being studied. Therefore, little can be determined concerning the impacts of the structure at this time.

5.4.2. Plan 2

At the present, the bridge crossings of the IHNC are a bottleneck to vehicular traffic, and the new bridge at St. Claude Avenue would facilitate traffic flow. Improved traffic patterns would make commuting from points downstream of the IHNC more attractive and could contribute to residential and commercial development. Remaining tracts of wooded and cleared lands would likely be targeted for development.

5.4.3. Plans 3a through 3f

5.4.3.1. Vicinity of the IHNC. The geography and social patterns in vicinity of the IHNC are defined to a large degree by the canal itself. There are many local residents who still feel that the construction of the lock and canal in the early 20th Century was a great injustice to the peaceful community which existing at the time, and that the community has suffered ever since because of the canal and lock.

5.4.3.2. Graving Site. The graving site is owned by the Port of New Orleans. The Corps of Engineers would obtain a temporary easement on the site to construct the lock modules. After completion of work necessary for the lock project, the site would be available for the Port of New Orleans to use or lease at their discretion. The development of the site for lock construction would make it more attractive to potential users including vessel repair companies and shippers. Industrial usage of the graving site could cause additional development of nearby land. The adjacent lands are zoned industrial.

5.4.3.3. Along Connecting Waterways. Lock replacement plans would tend to increase the attractiveness of the GIWW for moving cargos. It is possible that an increase in the number of businesses and industries, compared to the no action scenario, establish along banks of the GIWW in the vicinity of New Orleans after a new lock is constructed.

The existing lock on the IHNC is known to be restricting navigation traffic. A new larger and more efficient lock would relieve the bottleneck and allow more traffic to flow through connecting waterways. Data used for economic benefit calculations was used to determine the projected increase in the number of shallow and deep-draft trips which would be made on connecting waterways. Traffic projections were based on implementation of Plan 3f, the largest lock considered. The incremental changes in shallow-draft traffic are shown in Table 10. Changes in deep-draft traffic are shown in Table 11.

TABLE 10
PREDICTED CHANGES IN NUMBER OF TOWS
ON CONNECTING WATERWAYS FOR PLAN 3f

Year	GIWW East of IHNC	GIWW West of IHNC	Miss. River North of IHNC
2012 (Base Year)	+1,750	0	+1,750
2020	+2,850	0	+2,850
2030	+4,590	+160	+4,440
2040	+6,640	+60	+6,580
2060	+11,390	+320	+11,080

TABLE 11
PREDICTED CHANGES IN NUMBER OF
ONE-WAY, DEEP DRAFT TRIPS ASSOCIATED WITH PLAN 3f

Year	Miss. River South of IHNC	MRGO
2012 (Base Year)	-20	-100
2020	-20	-110
2030	-20	-140
2040	-30	-160
2060	-40	-230

Table 10 shows that there would be a considerable increase in the number of tows on the Mississippi River north of the IHNC and in the GIWW east of the IHNC with implementation of Plan 3f, compared to the no-action condition. No attempt was made to determine destination points for these tows. The number of tows using the GIWW west of the IHNC would increase somewhat in outlying years. No difference in the number of tows using Baptiste Collette Bayou or the Mississippi River south of New Orleans is predicted.

Table 11 shows that the number of deep-draft trips would decrease in the Mississippi River south of the IHNC and in the MRGO from project implementation. A decrease in trips is expected because ships would be able to use the new lock to move between the two waterways. At present, ships which must be moved between docks on the Mississippi River and docks along the IHNC or MRGO must make a circuitous trip out one channel to the gulf and up the other channel. No divergence from the no-action condition would be expected in the Mississippi River north of the IHNC.

Vessel traffic on the GIWW and MRGO causes erosion of unprotected banks. Bank erosion along the MRGO is especially severe, mainly from ship traffic. Erosion along the GIWW varies from minimal to severe depending on the reach and the soils found along its banks. The reach of the GIWW between the IHNC and Lake Borgne is experiencing minor to moderate rates of bank erosion. Barge traffic on the GIWW has been identified as one of the factors causing erosion of the wetlands adjacent to the channel although others types of vessels and wind-generated waves also contribute to the problem.

The indirect effects of a new deep-draft lock would be a decrease in the amount of erosion which would occur along the MRGO and an increase in the amount of erosion along the GIWW. Effects along the GIWW would be concentrated in the reach between the IHNC and Lake Borgne. The net effect of a new lock on coastal wetlands erosion has not been determined and no mitigation for the changes in vessel traffic on connecting waterways is proposed.